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The Systems-Based Mentoring Model within the process of technology integration

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Abstract
In recent, numerous attempts, approaches, and models related to the technology integration process are introduced. In those models, generally the teachers are located at the center of the process. Thus, it is important to choose a technology integration model in order to prepare the teachers for the technology integration, enable them to use the current and new technologies, intensify their belief related to new teaching technologies, and eliminate the barriers they may encounter during this process. In this context, the Systems-Based Mentoring Model comes into prominence at the point of resolving the problems that the teachers encounter in the learning environments. In the model, technology leadership is adopted as the main approach to the professional development of the teachers. It is stated that technology leader could play a supportive role against various barriers which the teachers are willing to integrate the technology (time, attitude, access, culture, professional development, etc.) and various strategies are presented in order to create a vision for technology integration, modelling the use of technology and training leader teachers. In the model, the teachers pass throughout various stages and they are encouraged to utilize the technology. The final objective of the model is to perform the technology integration through evaluating the current resources in schools and establish an integrated culture within the system which is supported by the teachers and the school administrators. It is important that supporting teachers by the experts for them to realize the technology integration transformation. Accordingly, the Systems-Based Mentoring Model has an importance of emphasizing the importance of technology leaders in encouraging and supporting the teachers during the integration process to reveal the roles of those leaders that should take over.

Keywords: technology integration models; systems-based mentoring model; technology leadership; teachers

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Introduction

Today, since it is aimed to train individuals who have the required skills to access information and use it effectively, expectations of educational institutions are changing in the light of the rapid developments in technology. The use of information and communication technologies (ICT) has now become inevitable in the learning environments and new tasks have been added to the mission of educational institutions. The effective ICT integration into the teaching-learning process and the management of technological resources have become a necessity. In this context, when the researches on the concept of technology integration that has an increasing importance in the educational community was examined, it is referred to the integration of technology with the learning process by making it a functional part in education (Gökoğlu, 2014; Kabakçı Yurdakul, 2011). It is also stated as a multi-dimensional, complex, difficult, and constantly changing process (Harris et al., 2009; Hsu, 2010; Mishra & Koehler, 2006;Roblyer,2006;Usluel &Demiraslan, 2005).

Harris et al. (2009) generally listed technology integration efforts as (a) software-focused initiatives; (b) demonstrations of sample resources, lessons, and projects; (c) technology-based educational reform efforts; (d) structured/standardized professional development workshops or courses, and; (e) technology-focused teacher education courses. The changes experienced in instructional technology lead to different reflection in learning environments and new methods and techniques for their usage are recommended. Thus, the use of new models and approaches to ICT integration process has been suggested as a dynamic process in schools at different levels (Roblyer, 2006).

Despite putting forward many models and approaches for ensuring technology integration, there are occasional difficulties in explaining the complexities arising from new technology constantly entering class and the interactions of barriers faced by teachers in the process of integration of these models. The strengths and weaknesses of these models and approaches are presented in Table 1.

Table 1. Technology integration models

Models	Strengths	Weaknesses
Five-Stage Model for Computer Technology Integration into Teacher Education Curriculum (Toledo, 2005)	-Placing technology in a planned way in the teaching and learning process. -Mentioning features, tasks and actions required before integration -Emphasizing the need for a mentor in the integration process -Making suggestions to determine and develop the level of integration of existing technologies of school/institution	-Having developed for teacher training programs -Reduced the success of the model by the students with inadequate ICT skills -Burden managers of school/institution with the majority of the responsibility in order to practice the model successfully
Systemic Planning Model for ICT Integration (Wang & Woo, 2007)	-Defending that ICT integration can be realized at various levels -Evaluating ICT integration with components such as content and pedagogy -Considering ICT as a hardware and software tools but not as a goal. -Aiming to place ICT into the levels of the learning experience and into all curriculum -Evaluating with the use of process-oriented rather than product-oriented assessment -Associated the integration process with deep professional knowledge and the internalization of ICT rather than the availability of ICT tools	-Not explaining why used ICT is chosen and how it will be integrated. -Regarding ICT integration as a linear process -Focusing on realization levels of integration -Not being important to be known by teacher/designer or to be realistic of the identified problems/status
Technological Pedagogical Content Knowledge	-Showing the teacher how to combine the technological information with pedagogy and field	-Not mentioning the teachers' internal factors preventing technology integration

Model (Mishra & Koehler, 2006)	knowledge -Focusing on how to use ICT tools -Emphasizing that teaching can be more effective with ICT tools -Relocating teacher to central in the integration process	(beliefs, attitudes etc.)
Pedagogical, Social, and Technological (PST) Model (Wang, 2008)	-Explaining the process of integration with components of pedagogy, technology and social interaction -Emphasizing the importance of teachers' social interaction in the process of integration -Using the technology so as to satisfy user and increase productivity -Adopting constructivist learning theory	-Regarding technology integration process as a supporting external component
E-capacity Model (Vanderlinde & van Braak, 2010)	-Evaluation of ICT integration at school and teacher levels -Regarding teachers' use of ICT as a process -Trying to achieve the ICT integration by optimizing the available resources -Regarding the mentoring in the integration process as an important factor	-Neglecting teachers' social environment -Remaining limited in explaining teacher's responsibilities, self-efficacy and feelings of uncertainty -Neglecting teachers' psychological factors, student's computer attitudes and ICT competencies
Concentric Circles Model (Tondeur et al., 2008)	-Examining integration with both teachers' features and school conditions considering intended use of technology. -Regarding integration of technology as a cyclical process. -Indicating that the school vision, in-service training in the school and the existing technology play an important role in determining the school conditions.	-Developed for teachers with positive technological faith -The necessity of an effective integration of ICT policy in school / institutions
Unified 5 W 1 H Integration Model (Haşlaman, Mumcu, &Usluel, 2008)	-Organizing the process in a systematic and planned way so as to increase student learning -Increasing student learning with using ICT in the teaching process in a systematic and planned way	-Only developed for improving students' learning -Neglecting teachers' personality traits
Technology Integration Planning Model (Roblyer, 2006)	-Presenting the flow chart for teachers to plan ICT integration -The necessity of in-depth thinking and planning about technology integration	-The necessity of counting all stakeholders in the integration process

As seen in the Table 1, ICT integration models adopt the teachers as the center of the integration process. Giving the support necessary to teachers in models and leadership regarding the integration process are considerable as the main goals. However, it is still needed to determine the required framework in such issues as who will provide this support and how it will be provided. Indeed, this framework is influenced by many factors such as the size of the school, the number of teachers, and ICT potential. Therefore, it is observed that there is a need for an effective technology integration model to enable them to use current and new technologies, to strengthen the belief about new teaching techniques, and to eliminate many barriers they face in this process in order to prepare teachers to integrate technology. In this regard, Bos (2011) state that the studies in the educational technology field showed a lack of conceptual and theoretical framework to guide teachers for the realization of teaching with technology.

Systems-Based Mentoring Model (SBMM)

It is observed to primarily attempt to carry out of technology-oriented approach and bring in technological resources for ensuring effective technology integration in education. Although the recommendations are made on the use of technology that improves the quality of education and will be the positive impacts for students' learning, it is observed that the teachers, one of the most important factors in this process, often use the technology for affairs outside of teaching-learning activities but do not sufficiently benefit from technology in the

teaching-learning process. In this respect, Zhao, Pugh, Sheldon, & Byers (2002) indicate that the teachers need to know contributions and limitations of various technologies and learn teaching applications of specific technologies and how to support the objectives of the training program in order to ensure the effective integration of technology into teaching-learning process. On the other hand, it is needed to provide the necessary pedagogical information to design meaningful learning with the support of technology and to ensure sustainability (Bauer& Kenton, 2005; Hughes, 2004; Koehler & Mishra, 2005; Waight & Abd-El-Khalick, 2007). In this regard, SBMM has come to the fore for the elimination of the barriers faced by teachers and the complexity caused by the constantly renewed technology in educational environment (Kopcha, 2010).

In the model mentoring is adopted as a basic approach for teachers' professional development. The various strategies such as explaining how a leader plays a role to facilitate, creating a vision for the integration of technology, modelling the use of technology and training of leading teachers in the face of various barriers (time, attitudes, access, culture, professional development, etc.) experienced by teachers who are eager to integrate technology are presented. In the model, teachers are guided to use technology being passed through a process consisting of several stages. The ultimate goal is to support technology integration by assessing the available resources in schools; to constitute a culture of technology integration throughout the system supported by teachers and school administrators for sustainability. The structure of the model is presented in Fig 1.

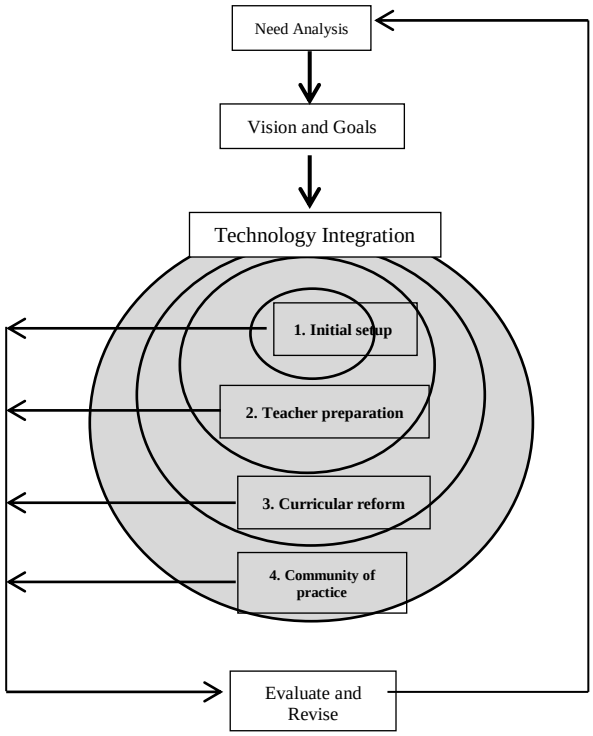

Figure 1. The Systems-Based Mentoring Model (Kopcha, 2010)

Need analysis

The model starts by performing a needs analysis throughout the system. In this way, a vision is created for technology integration and in accordance with this vision, short-term and long-term goals are set. At this stage, the possibilities of teachers' access to technology, the

influence of a culture supporting its use for teaching purposes, and the evaluation of current vision and goals for the use of technology are suggested. It is advised that survey, interview, observations about each teacher's educational technology and technology integration experience are used in carrying out the needs analysis.

Vision and goals

It will help create a vision to conduct a detailed needs assessment at beginning, evaluation of technological resources, and creation of long and short-term goals for teachers. The long and short term goals determined at this stage of the model will inform teachers about what to do and how to do. Since teachers use technology infrequently and for various purposes, some goals can be revised depending on teachers having special needs, in accordance with the small groups at the class level or according to subject field. During the identification of these goals and vision, the participation of teachers and administrators will be useful for their support in technology integration practices.

Technology integration

According to the model, technology integration consists of four basic steps. These steps are shown as overlapping circles in the model.

Initial setup: The Research studies show that they abandoned the technology integration when technology used does not work properly or they faced with out-dated technology (Bauer & Kenton, 2005; Lim & Khine, 2006). For this reason, in this stage, working together with teachers, the main objective for the mentor is to minimize the barriers that they encounter. Indeed, it is stated that with the help of a mentor, the teachers learn to cope with the problems, they can successfully cope with the problems that will be encountered in the future without the need for assistance (Franklin, Turner, Kariuki, & Duran, 2001; Smith & Smith, 2004) the text on after a punctuation mark.

Teacher preparation: In this stage, the role of the tutor is to prepare teachers to use technology. Since it is stated that existing basic technological skills are an important component for the use of technology for teaching (Hew & Brush, 2007; Rakes, Fields, & Cox, 2006; Zhao et al., 2002). Tutor must focus on shortcomings in basic skills related to teachers' use of technology. The tutors form this system in in the form of a formal group meetings such as weekly team meetings (Gallagher, 2000), helping teachers in courses supported by technology (Smith & Smith, 2004), and making a mini interview in passing from one room to another in breaks and in the teachers' room (Marcovitz, 2000). In these meetings to train teachers, tutors should show the teachers the paths to integrate technology in a way consistent with pedagogical beliefs and practices and should hold discussions with teachers on different ways to integrate technology. The tutors will need to work closely with the teachers at this stage because probably teachers will easily adopt the approach to teaching with technology (Whitehead, Jensen, & Boschee, 2003). On the other hand, it is necessary to ensure orderly continuity of the training given to teachers by tutors. The studies show that the teachers training in an orderly manner have higher probability to integrate the technology so as to support the teaching (Bradshaw, 2002; Feist, 2003).

Curricular reform: In this stage, the main objective for mentors is to increase the teachers' experience with pedagogical knowledge that is necessary to integrate technology. Tutor must spend time to evaluate and review existing systems and design new processes to be necessary to use more technology. The development of every teacher should be monitored regularly and appropriate training should be planned relying on the needs. Teaching scenarios compatible with the curriculum using technology should be designed so as to provide that teachers can focus on the curriculum. In this

context, Hughes (2004) and Koehler, Mishra, & Yahya (2007) state that design of technology-based course to present teachers and focus on supporting education allow them to use technology more in their future. On the other hand, since teachers' negative thoughts about that technology cannot improve teaching may lead to failure. Design of technology-based course seems important in terms of integrating technology with the curriculum (Hinson, LaPrairie, & Heroman, 2006). At this point, mentor should try to motivate teacher and spend time to create the designs of technology-based course.

Community of practice: At this stage, it is tried to make a school culture that teachers and administrators can work in cooperation to eliminate the barriers, which may occur about technology integration and during the use of technology. In this context, it is stated that the use of technology is one of the factors shaping the school culture (Çakıroğlu, Akkan, & Güven, 2012). Hughes & Ooms (2004) revealed that they begin to design and practice technology-supported courses in environments where teachers are interested in supporting each other. Similarly Glazer, Hannafin, & Song (2005) state that taking part in a collaborative group improves teachers' motivation and strengthen to learn and use technology and to design technology based lessons.

Evaluate and revise

After the completion of each stage of technology integration it is necessary to evaluate the success about whether the vision and goals set at the beginning of the model are reached. Assessment is important to give an idea to the practitioners about deciding whether to go through another phase in the process of technology integration and redesigning the processes according to each teachers' needs. As also indicated in the model, to guide teachers for the realization of effective ICT integration, to provide them the necessary support, and to encourage them to use ICT in their course, ChanLin (2005), emphasizes that the administrator support and technical support have the critical importance to integrate technology in the curriculum. In this context, McLeod (2003) state that the nonfulfillment to provide teachers and other users of technology with adequate support could contribute to failure of attempts of the integration of technology in schools. This draw attention to mentoring in the schools as one of the most important factors in this process (Byrom & Bingham, 2001).

Conclusions and recommendations

Since most of the teachers are digital immigrants and their students are digital native (Prensky, 2001), it can be considered as one of the factors that left teachers behind students in the matter of use of technology in education. In this case, the presence of individuals to mentor in the matter of giving place to technology in the courses and to inform teachers about educational technology are important in terms of the realization of technology integration.

It is known that teachers' beliefs about technology are important to give place to technology in their courses. In this regard, the teachers should be encouraged for the use of technology. It can be stated that the mentors, who are an important component of SBMM, and the roles exhibited by these mentors have a supporting effect on teachers' technology integration in their courses.

In conclusion, today while the importance of technology integration into the learning environments has been increasing, it is important to support teachers by the experts in their field to implement this transformation for the successful integration of technology. In this respect, it seems that SBMM can be used in the appropriate schools since it underlines the importance of the mentors who guide the teachers in the integration process, makes the

necessary intervention, and reveals the roles which the mentors need to take.

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